

Overview of Dentures' Demand to Support the Improvement of Life Quality of the Elderly at High-Level Life Expectancy in Indonesia

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Overview of Dentures' Demand to Support the Improvement of Life Quality of the Elderly at High-Level Life Expectancy in Indonesia

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Abstract

Aims: The missing teeth should ideally be replaced to anticipate some serious consequences. The most obvious effect of that is esthetics, but something like migration and rotation of teeth, chewing inefficiencies, temporomandibular joint disorders, and speech disorders can also affect function and health. Based on preliminary research, almost all elders who live in nursing homes in Surabaya lose their teeth, partially or completely, and they leave without replacing them with dentures for several reasons. This research intended to study the demands of patients for dentures in the elderly group so that future trends in health and management strategies can be improved. **Materials and Methods:** A cross-sectional study was conducted among 80 elderly individuals with multistage random sampling. The design was a descriptive analytical study. The instrument of this study was a validated questionnaire about the demand of dentures. Data analysis method used in this study was descriptive method, and data calculation was presented in percentage form by using software SPSS 16.0. **Results:** Most of the participants (45 people) presented low level of demand toward dentures (56.2%), with the rest of 35 people having high demand on dentures (43.8%). **Conclusions:** The demand for low dentures can result in poor oral health, so it is highly recommended that public health programs cover the oral health population, especially the elderly, so that future trends in health and management strategies can be improved.

Keywords: Demand, Denture, Elderly

INTRODUCTION

Along with the increasing life expectancy of the Indonesian population, the population of elderly people (60 years and over) will also increase.^[1,2] Over the past two decades, populations have increased more than twice as fast as younger populations, and they constitute a disproportionate share of spending on medical care.^[1] This disproportionate share of expenditures can be attributed, in part, to the relatively higher needs of the elderly for individualized care and the increasing incidence of chronic diseases and impairment with age. Tooth loss can be caused by caries, periodontal disease, severe trauma, and attrition.^[1]

In elderly phase, the elders should be more noticed of their health condition, especially dental and oral health. The presence of systemic and chronic disease affect elderly's quality of life. Life expectancy and quality of life can be maintained or increased. The life expectancy of the Indonesian

population is recorded at 70.1 in 2010–2015, or up from 69.1 (2005–2010).^[2]

Indonesia's life expectation is in 6th position among ASEAN countries. Life expectancy figures can sum up many aspects about a country, such as economic, social, and health levels, including being subject to policy review that a country has made. The Human Development Index (HDI) is a summary measure of average achievement in key dimensions of human development: a long and healthy life, being knowledgeable, and have a decent standard of living. Indonesia's HDI value for 2015 is 0.689 – which puts the country in the medium human

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24

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19

development category positioning it at position 113 out of 188 countries and territories.^[2]

The HDI is a summary measure of average achievement in key dimensions of human development: a long and healthy life, being knowledgeable, and have a decent standard of living.

Elderly is a person who has entered the age of 60 years old.^[1] In elderly phase, a person experience some either physiological or pathological changes in their body system, as well as changes in dental structure. The elderly are generally faced with the problem of partial or complete loss of the tooth.^[3] Tooth loss has to do with denture. The choice of a person's denture type is adjusted to the number of missing tooth elements.^[4] The untreated toothloss (immediate replacement of dentures has not been conducted) can cause pathological migration of the rest of the tooth, alveolar bone resorption, and malfunction of mastication (especially to speech impairment).^[5] Ideally, tooth loss should be replaced with dentures to anticipate possible disruptions, but existing data show that not all tooth loss has been replaced. Basic Health Research Results (RISKESDAS) in 2007 showed that most people aged 55–65 years old (23.5%) had tooth loss, but only 7.1% had replaced their missing teeth.^[6]

The patient's need in making dentures is closely related to the presence and absence of demand factors for the manufacture of denture. According to Davenport, demand is the requested or desired treatment according to the patient's wish.^[7] In reality, not all patient conditions require artificial dentures then continue to be demand.^[8] Treatment planning is still an art, the factors which influence decision-making for oral health care which can only be carried out for an individual and not a group, and the result must serve the needs of the patient and enhance the quality of his or her life. The factors will influence decision-making for oral health care which can only be carried out for an individual and not a group, and the result must serve the needs of the patient and enhance the quality of his or her life.

A survey conducted by the authors to 53 elderly people, living in some orphanage scattered in Surabaya area, showed that almost all elderly people have lost either partially or completely teeth. Only 11 were using denture and some did not for a variety of reasons. There were no statistical data on this situation and the reasons mentioned above aroused the author's interest to check the demand description for dentures in elderly people in nursing home in Surabaya.^[9]

This research intended to study the demands of patients for dentures in the elderly group so that future trends in health and management strategies can be improved. It is expected that this research data can be a reference for the clinician in the planning of services programs and education of dental and oral health for the wider community, especially the elderly.

MATERIALS AND METHODS

A cross-sectional study with a representative sample of 80 elderly individuals aged 61 years old or older residing in Surabaya Indonesia was performed. This was an observational

descriptive study with cross-sectional approach. This study was conducted at three Local Nursing Houses in Surabaya from August 2016 to November 2017 (Ethical approval for doing this study has been obtained from Research Ethic Committee of Faculty of Dental Medicine Universitas Airlangga with certificate number 59/KKEPK.FKG/VI/2015). The sample in this study was elderly who had lost teeth and did not use dentures, willing to be respondents, willing to fill informed consent, and able to communicate well. The sample size was obtained by using Lwanga and Lemeshow's formula, and 80 people were obtained.

Sample was selected using multistage random sampling method. This technique was by taking samples in several stages. First, sampling was done randomly to select the nursing homes. Three nursing homes were selected, they are UPTD Griya Wreda Surabaya, Tresna Wredha Hargo Dedali, and Darul Aytam Dluafa' Ruqoiyah Wredha. Three of them were located in Central Surabaya. Furthermore, the researchers took the sample in accordance with the proportion of the elderly in each nursing home. The third stage was done by performing simple random sample technique. This study began with a letter of introduction of the study permit application obtained from the dentistry study program. The study started after obtaining the permission from nursing home. Respondents who were selected as research individuals were requested for prior approval proved by the signing of informed consent.

The study was conducted by distributing questionnaires to be answered. The questionnaire that we used before has gone through the process selection and reliability–validity tested, so it will minimize the chance of getting biased when filling out the questionnaire or evaluating the answers. The questions contained in the questionnaire were made based on Demand theory by Davenport (2000) and were refined by Green's health behavior theory, which included predisposing, enabling, and reinforcing. The variables of this study are demand for denture, age, gender, education level, family income, insurance ownership, number of tooth loss, and location of tooth loss. Measurement of respondent's responds for each variable questions is done by giving a value to each question regarding demand. The measurement scale results obtained vary such as intervals, nominals, and ordinals.^[2]

To collecting demand for healthcare data, several studies use the questionnaire method, and it is considered effective enough to see the results of demand. However, it would be better to add variables to the questionnaire questions such as supply or availability of dentures in the location of the nursing home.^[2]

This study was done using primary data and secondary data. Primary data were direct data obtained from direct interviews with respondents with questionnaires guidelines on the demand of denture on the elderly in nursing homes of Surabaya. Secondary data were data of respondent identity obtained from note/documentation at research location. Data analysis method used in this study was descriptive method, and data

calculation was presented in percentage form by using software SPSS 16.0 (Contractor/manufacturer is SPSS Inc., 233 South Wacker Drive, 11th Floor, Chicago, IL 60606-6412, USA. Patent No. 7,023,453).

For questionnaire validity and reability, statistic analysis conducted is Cronbach's Alpha test. The data analysis method used in this study is descriptive method; data calculation is presented in the form of a percentage using software SPSS.

RESULTS

Based on the results of the study, it can be seen that of 80 respondents, 47 aged 60–70 years and 33 were >70 years old. The results showed that the majority were female, had no insurance, and had low level of education and low income level [Table 1].

Table 2 shows that 47 respondents aged 60–70 years had lost a lot of teeth. The same number of respondents (17) lost many and whole teeth, and 13 respondents lost few teeth. Whereas there were 33 respondents aged >70 years old mostly lost a lot of teeth. The overall majority of tooth loss location was a combination of anterior and posterior.

Table 3 shows that respondents aged 60–70 years are 25 people (53.2%), and there are 20 (60.6%) respondents aged >70 years old. Twenty people (60.6%) had low demand. There were 38 females and 7 males. The majority had low demand. Based on the level of education, the majority of respondents who had low education as many as 37 people (59.7%) had low demand and those who had higher level of education mostly had high demand as many as 10 people (55.6%). Respondents who did not have insurance were 32 people (51.6%) and those who had insurance were 13 people (72.2%). The majority had low demand. Respondents who had low income were 38 people (54.3%) and those who had high income were 7 people (70%). The majority have low demand.

Demand for dentures in the elderly can be seen based on the number and location of tooth loss in Table 4. It shows that 9 people lost few teeth (52.9%) and 16 people (51.6%) lost their whole teeth. The majority had high demand. Respondents who lost a lot of teeth were 22 people (68.8%), and the majority had low demand.

The results of demand research based on the location of tooth loss showed that the elderly who lost anterior teeth had the same number of low and high demand. Respondents who lost posterior teeth were 10 people (62.5%) and the ones who lost their anterior and posterior combination teeth were 31 people (55.4%). They had low demand. However, if we look at Table 4, it also shows that older people who lost anterior teeth had greater denture needs than those who lost posterior teeth. The results shows 50% of respondents who lost their anterior teeth have high demand toward dentures. This shows that the loss of anterior teeth contributes to the increased need for denture.

Table 1: General characteristics of respondents and ownership of insurance based on age

Variables	Age*		Total, n** (%)
	60-70 years old, n (%)	>70 years old, n (%)	
Sex			
Female	41 (58.6)	29 (41.4)	70 (100)
Male	6 (60)	4 (40)	10 (100)
Total	47 (58.8)	33 (41.2)	80 (100)
Ownership of insurance			
No	39 (62.9)	23 (37.1)	62 (100)
Yes	8 (44.4)	10 (55.6)	18 (100)
Total	47 (58.8)	33 (41.2)	80 (100)
Education			
Low	40 (64.5)	22 (35.5)	62 (100)
High	7 (38.9)	11 (61.1)	18 (100)
Total	47 (58.8)	33 (41.2)	80 (100)
Income			
Low	41 (58.5)	29 (41.4)	70 (100)
High	6 (60)	4 (40)	10 (100)
Total	47 (58.8)	33 (41.2)	80 (100)

*Age of respondents, **Numbers of respondents

Table 2: Number and location of tooth loss based on age

Variables	Age*		Total, n** (%)
	60-70 years old, n (%)	>70 years old, n (%)	
Number of tooth loss			
Few	13 (76.5)	4 (23.5)	17 (100)
Many	17 (53.1)	15 (46.9)	32 (100)
Whole	17 (54.8)	14 (45.2)	31 (100)
Total	47 (58.8)	33 (41.2)	80 (100)
Tooth loss location			
Anterior	4 (50)	4 (50)	8 (100)
Posterior	10 (62.5)	6 (37.5)	16 (100)
Anterior and posterior	33 (58.9)	23 (41.1)	56 (100)
Total	47 (58.8)	33 (41.2)	80 (100)

*Age of respondents, **Numbers of respondents

Table 5 shows that the demand for dentures is influenced by 3 main factors, namely attitudes toward dental health, dental pain experience, and treatment costs. The relationship of the three variables was positive. Attitudes related very strongly ($r = 0.8$), dental pain experience correlated with moderate relationship strength ($r = 0.593$), while maintenance costs were associated with strong strength ($r = 0.664$).

DISCUSSION

In the preliminary survey conducted, the number of respondents in the survey was 53 respondents. This number is obtained from the results of stratified random sampling with the results of at least 53 samples. While in this study, a similar formula was used, and it was suggested to add the number of samples to 80 samples. The impact of the results of this study

Table 3: Respondent characteristics and insurance ownership based on the level of demand for dentures

Variables	Demand*		Total, n** (%)	P	RP
	Low, n (%)	High, n (%)			
Age (years old)					
60-70	25 (53.2)	22 (46.8)	47 (100)	0.8	0.9
>70	20 (60.6)	13 (39.4)	33 (100)		
Total	45 (56.2)	35 (43.8)	80 (100)		
Sex					
Female	38 (54.3)	32 (45.7)	70 (100)	0.35	0.49
Male	7 (70)	3 (30)	10 (100)		
Total	45 (56.2)	35 (43.8)	80 (100)		
Ownership of insurance					
No	32 (51.6)	30 (48.4)	62 (100)	0.637	0.9
Yes	13 (72.2)	5 (27.8)	18 (100)		
Total	45 (56.2)	35 (43.8)	80 (100)		
Education					
Low	37 (59.7)	25 (40.3)	62 (100)	0.25	1.34
High	8 (44.4)	10 (55.6)	18 (100)		
Total	45 (56.2)	35 (43.8)	80 (100)		
Income					
Low	38 (54.3)	32 (45.7)	70 (100)	0.80	0.93
High	7 (70)	3 (30)	10 (100)		
Total	45 (56.2)	35 (43.8)	80 (100)		

*In percentage, **Numbers of respondents. P value of Chi-square test ($\alpha=0.05$). RP: Ratio prevalence

Table 4: Number and location of tooth loss based on the level of demand for dentures

Variables	Demand*		Total, n (%)
	Low, n (%)	High, n (%)	
Number of teeth loss			
Few	8 (47.1)	9 (52.9)	17 (100)
Many	22 (68.8)	10 (31.2)	32 (100)
Whole	15 (48.4)	16 (51.6)	31 (100)
Total	45 (56.2)	35 (43.8)	80 (100)
Tooth loss location			
Anterior	4 (50)	4 (50)	8 (100)
Posterior	10 (62.5)	6 (37.5)	16 (100)
Anterior and posterior	31 (55.4)	25 (44.6)	56 (100)
Total	45 (56.2)	35 (43.8)	80 (100)

*In percentage

on the preliminary survey carried out was the result of factors that influence the demand for dentures. Where at the time of the survey, only the distribution of use of dentures was carried out by respondents.^[9]

The use of dentures can improve the function of mastication and oral health in the elderly. Fixed and removable dentures are commonly used to replace missing teeth to improve chewing, esthetic, and pronunciation. Despite these favorable effects, not all people who lose their teeth use dentures. Reasons include the difficulty of access to dental care for the elderly as well as cultural factors. Zainab *et al.* identified low education levels, low income, and scarce availability of public oral health

services as barriers to use of oral healthcare services among the people.^[10] The function of mastication and oral health must be maintained to the maximum extent possible because oral health is an important key to overall body health. If the health of the oral cavity is poor and its function is not optimal, it will disturb the health and function of other organs in the human body. Therefore, oral health is a support for improving the quality of human life because one of the key dimensions to improve the quality of human life is the health dimension. The quality of life of the elderly will decrease if they experience pain, difficulty in chewing and swallowing food, and disruption of social relations due to oral disorder.^[9] In their study, Zainab *et al* has proven that the use of dentures can increase nutrient intake and quality of life in the elderly.^[10]

It was shown in this study that the majority of the elderly demand to make dentures is low. The low demand for dentures is significantly affected by at least 3 factors, namely predisposing factors (the attitude of the elderly to dental health), enabling factors (the cost of treatment) and re-enforcing factors (the experience factors of using dentures).

Attitudes play an important role in increasing demand for health care, specifically the demand for dentures. The elders did not felt any disturbance or complaints toward their oral cavity conditions during tooth loss. Reciprocally the social support around them. There was no any dental health education or treatment offer.^[11] Thus, they feel they do not need to submit a request for the manufacture of dentures because they are not considered compulsory. This is supported by Kristantis's research which states that the low level of public

Table 5: Factors that influence the demand for dentures in the elderly

Variables	B**	P
Constant	0.037	0.960
Age	0.425	0.277
Sex	-0.055	0.917
Education	-0.216	0.059
Number of missing teeth	0.468	0.144
The location of missing teeth	-0.547	0.119
Insurance participation	0.779	0.185
Income	-0.319	0.596
Availability of dentists	0.462	0.712
Denture Maintenance	-0.554	0.526
Attitudes toward dental health	0.807	0.000*
Knowledge	-0.096	0.543
Perceptions of dental health	-0.110	0.480
Experience of using dentures	0.593	0.009*
Family and environmental support	0.408	0.089
Maintenance costs	0.664	0.019*

*Significant, **Linier regression analysis results

awareness in the treatment of oral and dental health is caused by the perception that disruption in the teeth and mouth is not a dangerous or deadly disorder.^[8] Other than based on the results of open interviews, elderly people felt that their closest family or people gave less attention to them because they left the elderly in the nursing home to be separated. Thus, if there was advice or reinforce from the closest person, it did not really affect the respondent in asking for dentures. Lack of support from a guardian or family can cause difficulties for patients to come for treatment and do maintenance according to procedure.^[6] The low demand for dental care in the elderly according to Cohen and Bryant can also be due to the lack of awareness of the elderly about the need for dental care because they suffer from loss of natural teeth for a long time.^[12]

Other factors that influence the utilization of health services is gender.^[5] The research also showed that the percentage of male elderly who had low demand was much higher than of female elderly. This is consistent with the previous study that in the same clinical condition of dental and oral health, women are found to be more dissatisfied with the esthetics of their teeth and mouth.^[13] While for elderly men and women who have low demand, they are likely not so concerned with their appearance because every day, the residents of the home meet up, so they still felt confident and not bothered even though they have lost a lot of teeth.

Demand for dentures in this research is also known to be influenced by other factors, such as education.^[14] The elderly who lost their teeth were mostly low educated, and unfortunately, they have low demand [Table 3]. This is due to the fact that they received less information about their health needs compared to the higher education status. The elderly with low level of education will only seek dental treatment when there was clear morbidity. Respondents in this study,

who had low or high income, mostly have low demand for dentures. This is likely because the cost of making dentures is still considered quite expensive by most respondents. Although the economic level is good, the cost of dental care, especially the manufacture of dentures, is still quite high. This is also supported by previous study conducted by Rusilanti which stated that 88% of the individuals studied had financial constraints in making dentures.^[3]

This is also supported by previous research conducted by Masood which stated that 88% of the individuals studied had financial constraints in making dentures.^[15] Ownership of insurance in this study does not affect the demand for dentures. Insurance does not cover the cost of making dentures, increasing consumer demand for health services in several countries because of more complete care facilities offered by the government and the private sector. Another factor that influences health demand is income.^[16,17] Respondents' income that makes denture treatment is not a top priority in their daily lives. This statement is supported by previous research, which stated the relationship between high income and the large demand for health care, especially in terms of modern health services.^[18,19] If income increases, the number of goods and health services increases. In low-income communities, they will meet the needs of previous items. After the needs of goods are met, they will take care of their health.^[13,20-22]

The third factor that plays a major role in the demand for denture use is the experiences of using denture. In this study, there were elderly who were actually rich and had the cost to make dentures but have low demand for dentures. This was because there were negative experiences from the elderly who used dentures. Some of them thought that using dentures would cause discomfort. In table 4 shows that 50% of respondents who lost their anterior teeth want to make dentures. This is in accordance with previous studies which say that elderly people with anterior tooth loss have a strong urge to replace tooth loss.^[23,24] The results of this study also showed that loss of teeth at the anterior location heightened the need for denture.

The low demand of dentures occurred in lost of posterior teeth group and lost of both anterior and posterior teeth group. Low demand for dentures for parents based on the number and location of tooth loss is likely because parents have lost their teeth for too long and there are environmental factors that do not care about the conditions making the elderly feel comfortable and tend to adapt to existing conditions without trying to get help care. As for other reasons, respondents consider dentures no longer needed because of old age, so esthetics are not a priority anymore. In addition, this low denture demands phenomenon can be influenced by respondent's ignorance and low knowledge of dentures.

Limitations in this study are the variables and theories used were not maximal. There are more risk factors that is not included in this research, such as supply of the dentures and private facility owned by the elderly. Further research is needed to look at other factors that escaped this study.

CONCLUSIONS

Based on the results of this study, it is known that the demand for elderly for dentures is still low. This is strongly influenced by economic factors, namely the majority of respondents' income levels and experience wearing denture. In the global context, there are concerns about elderly oral health, because it is directly related to the quality of life of this population. The determination of this quality is basically related to living conditions, public health policies, and cross-sectoral actions. Denture need was strongly associated with individual socioeconomic position. It was also verified that the HDI in the city level contextual was associated with the demand of dentures. Globally, the demand for low dentures can result in poor oral health, so it is highly recommended that public health programs cover the oral health population, especially the elderly, so that future trends in health and management strategies can be improved.

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Conflicts of interest

There are no conflicts of interest.

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